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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/714,734	11/17/2003	Floribertus Heukensfeldt Jansen	140042 (1306-46)	4658

6147 7590 08/22/2007  
GENERAL ELECTRIC COMPANY  
GLOBAL RESEARCH  
PATENT DOCKET RM. BLDG. K1-4A59  
NISKAYUNA, NY 12309

EXAMINER
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ROY, BAISAKHI

ART UNIT	PAPER NUMBER
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3737

MAIL DATE	DELIVERY MODE
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08/22/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	Application No. 10/714,734	Applicant(s) JANSEN ET AL.	
	Examiner Baisakhi Roy	Art Unit 3737	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 16 October 2006.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-13 and 15-24 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-13 and 15-24 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Response to Arguments*

1. Applicant's arguments with respect to claims 1-13 and 15-24 have been considered but are moot in view of the new ground(s) of rejection.

### *Claim Rejections - 35 USC § 102*

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1, 2, 4, 7-9, and 15-24 are rejected under 35 U.S.C. 102(e) as being anticipated by Kruger (2004/0127783). Kruger discloses a system and method for localization of fluorescence in a scattering medium by illuminating a scattering medium with an excitation light such as a laser to excite the fluorescence [0024], using a fluorescent dye such as Cy3 dye within a pre-selected region of the scattering medium for absorbing and emitting light in the NIR region of the light spectrum [0051], an ultrasonic scanning system for generating ultrasonic pulses where the pulses are configured to induce an acoustic lens to modulate the emitted light from the fluorescent dye, where the system is a single-ultrasonic transducer or a phased array of single element ultrasonic transducers that is scanned over the pre-selected region of the scattering medium [0023, 0029-0030]. Kruger further teaches reconstructing a spatial

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distribution of the fluorescence in the scattering medium from the detected signal and scanning a volume of the scattering medium with an ultrasonic beam and detecting the modulated optical signal for each scanning location [0041-0046, 0050-0051, fig. 4, 5, 6, 8]. The optical detection system includes a light collection and delivery system including at least one optical fiber for delivering collected light from the scattering medium to the detector such as a photoacoustic detector [0027]. Kruger teaches the application of excitation frequencies both inside and outside the frequency band of fluorescence of the dye marker to develop thermoacoustic images with and without the dye marker fluorescence [0012].

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kruger in view of Ogawa. Ogawa also discloses a photo-detection apparatus wherein light is modulated with an ultrasonic wave (abstract) and further discloses modulation using a gradient refractive index lens (GRIN). The light follows the optical transmission path at the collimating portion, or the GRIN, and is subjected to intensity modulation (col. 8). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the disclosure of Kruger in light of the disclosure by Ogawa to include a GRIN for

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modulating the optical signal, as the use of a lens is a simple and well-known method known in the art to modulate a signal.

6. Claims 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kruger in view of Sfez et al. Kruger does not explicitly teach the use of sinusoidal ultrasound pulses. In the same field of endeavor Sfez et al. disclose an apparatus and method for probing light absorbing agents in biological tissues including the steps for ultrasound modulated light tomography, where the modulation is done by a sinusoidal signal that is time dependant (paragraph 161). It would have therefore been obvious to one of ordinary skill in the art to use the teaching by Sfez et al. to modify the teaching by Kruger for the purpose of improving phase discontinuities [0088].

7. Claims 10, 11, and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kruger in view of Nelson, et al (6216540). Kruger, as discussed above, substantially discloses the invention as claimed, however fails to explicitly disclose details of the detecting step. Nelson discloses sinusoidal wave modulation wherein the temporal or phase properties may be utilized. Nelson further discloses that a variety of time-resolved optical imaging techniques are well known in the imaging art for use with highly scattering media including heterodyne, homodyne, and gating (cols 19 and 20). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the disclosure of Kruger to include well known detection techniques in order to reduce the noise and improve detection of the signal.

8. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kruger in view of Schmid. Kruger, as discussed above, substantially discloses the invention as

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claimed, however fails to explicitly disclose the use of a double cross correlation technique. Schmid discloses a device for noise rejection used in sensing light from an optical path in which cross-correlating circuits are used to reduce noise. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the disclosure of Kruger in light of the disclosure of Schmid to include multiple cross-correlating circuits to the device disclosed by Kruger in order to reduce the noise in the measurements to obtain an optimal signal.

### ***Conclusion***

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Baisakhi Roy whose telephone number is 571-272-7139. The examiner can normally be reached on M-F (7:30 a.m. - 4p.m.).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian L. Casler can be reached on 571-272-4956. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

BR

BR

  
BRIAN L. CASLER  
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TECHNOLOGY CENTER 3737